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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/769,594	01/25/2001	Hang Jin	SAMS01-00135	4401

7590 06/28/2004

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EXAMINER	
NG, CHRISTINE Y	
ART UNIT	**PAPER NUMBER**
2663	

DATE MAILED: 06/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/769,594	JIN ET AL.	
	Examiner	Art Unit	
	Christine Ng	2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 January 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "said synchronizing signal" in line 4 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-5, 7-13 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,480,483 to Yahata et al in view of U.S. Patent No. 6,621,810 to Leung, and in further view of U.S. Patent No. 6,194,970 to Nielsen et al.

Referring to claims 1 and 8, Yahata et al disclose in Figures 4-6 a system for synchronizing a plurality of base stations (Figure 4, master base stations CS1, CS2... and respective slave base stations CS100, CS200...). Refer to Column 11, line 64 to Column 12, line 3. The system comprises:

A GPS receiver (Figure 5, reference frame timing signal generating device 40) in one of the plurality of base stations (master base stations CS1, CS2...) for receiving a regulated clock signal (reference frame timing). The reference frame timing signal generating device 40 receives time information from a GPS and generates a frame timing signal as a reference based on the received time information. Refer to Column 12, line 66 to Column 13, line 8.

A clock recovery circuit (Figure 6, timing clock generating circuit 53), in at least one other of the plurality of base stations (slave base stations CS100, CS200...), wherein the circuit utilizes the regulated clock signal (reference frame timing) retrieved from a data stream for generating a synchronizing master clock signal for the at least one other of the plurality of base stations (slave base stations CS100, CS200...). Based on the reference frame timing received from a master base station, the timing clock generating circuit 53 generates an internal operating clock of the slave base stations in synchronization with the reference frame timing. Refer to Column 14, lines 39-46.

Yahata et al do not disclose a gigabit Ethernet network for interconnecting the plurality of base stations.

Leung discloses that very high-speed interfaces such as a gigabit Ethernet interface can be used on routers in wireless systems to control sending and receiving packets among nodes such as base stations and mobile units. Refer to Column 1, lines 11-63. Gigabit Ethernet is an Ethernet protocol used in local area networks that offers a high data transmission rate of one gigabit per second. Therefore, it would have been

obvious to one of ordinary skill in the art at the time the invention was made to include a gigabit Ethernet network for interconnecting the plurality of base stations; the motivation being that gigabit Ethernet provides a very high data rate for faster data transmission than other Ethernet standards.

Yahata et al also do not disclose a holdover stable oscillator in one of the plurality of base stations.

Neilsen et al disclose in Figure 1 a device that provides a GPS signal to a base station. The device comprises holdover stable oscillator (Elements 106 or 107) that controls timing of the system when the GPS receiver (Elements 102 and 103) fail during holdover periods. Refer to Column 3, lines 44-54. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a holdover stable oscillator in one of the plurality of base stations; the motivation being that a GPS signal is required to synchronize base stations with each other in order to handle handoff between mobile phones. Since GPS systems are "placed high relative to surrounding terrain", they can easily loose contact with base stations so an oscillator must be used to "provide a time reference during this holdover period, as long as the oscillator is stable enough to keep the base stations sufficiently synchronized with other base stations". Refer to Column 1, lines 40-61.

Referring to claims 2 and 9, Yahata et al disclose in Figure 5 a controller (clock/control circuit 31) for sending the GPS regulated clock signal (reference frame timing) to the at least one other of the plurality of base stations (slave base stations CS100, CS200...). Each of the master base stations CS1, CS2... transmits a control

channel signal in timing synchronization with the reference timing signal from reference frame timing signal generating device 40 through the clock/control circuit 31. Refer to Column 13, lines 48-53.

Referring to claims 3 and 10, Yahata et al disclose in Figure 6 a transceiver circuit (frame timing detection/control circuit 54), in the at least one other of the plurality of base stations (slave base stations CS100, CS200...), for processing transmissions. The frame timing detection/control circuit 54 in the slave base stations CS100, CS200... controls the control channel signal observation period to obtain a reference frame timing from a master slave station CS1, CS2. Refer to Column 14, lines 16-38. Yahata et al do not disclose that the transceiver is a gigabit transceiver and that it is used for processing gigabit Ethernet transmissions. Refer to the rejections of claims 1 and 8.

Referring to claims 4 and 11, Yahata et al disclose in Figure 6 a connector for coupling the clock recovery circuit (timing clock generating circuit 53) to the gigabit transceiver (frame timing detection/control circuit 54). Refer to the arrow connecting timing clock generating circuit 53 to the frame timing detection/control circuit 54.

Referring to claims 5 and 12, Yahata et al disclose in Figure 6 a receiver portion (not shown) of the gigabit transceiver circuit (frame timing detection/control circuit 54) being coupled with the clock recovery circuit (timing clock generating circuit 53) for retrieving a transmitted GPS clock signal. The frame timing detection/control circuit 54 of each slave station CS100, CS200... receives control signals from master base stations CS1, CS2... to determine a frame timing for itself. Refer to Column 14, lines 30-38.

Referring to claims 7 and 13, Yahata et al disclose in Figure 6 a synchronizing signal (control signal from the control center and mobile station) being generated (by clock/control circuit 51) and sent to the receiver portion, and a transmitter portion, of the gigabit transceiver circuit (frame timing detection/control circuit 54). The clock/control circuit 51 receives a control signal from the control center and the mobile station and sends it to frame timing detection/control circuit 54. Refer to Column 13, line 64 to Column 14, line 1 and Column 14, lines 16-18.

Referring to claim 15, Yahata et al disclose in Figures 4-6 a method for synchronizing a plurality of base stations (Figure 4, master base stations CS1, CS2... and respective slave base stations CS100, CS200...). Refer to Column 11, line 64 to Column 12, line 3. The method comprises receiving a regulated clock signal (reference frame timing) into a GPS receiver (Figure 5, reference frame timing signal generating device 40) installed in one of the plurality of base stations (master base stations CS1, CS2...); transmitting the clock signal from the GPS receiver (Figure 5, reference frame timing signal generating device 40) to at least one other base station (slave base station CS100, CS200...); generating a synchronizing, master clock signal from a received clock signal (reference frame timing) for synchronizing the at least one other of the plurality of base stations station (slave base station CS100, CS200...). Refer to the rejections of claims 1 and 8.

Yahata et al do not disclose the step of: responsive to a determination that the GPS receiver is offline, utilizing a holdover stable oscillator to generator the clock signal.

Neilsen et al disclose in Figure 1 a device that provides a GPS signal to a base station. The device comprises holdover stable oscillator (Elements 106 or 107) that controls timing of the system when the GPS receiver (Elements 102 and 103) fail during holdover periods. Refer to Column 3, lines 44-54. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of: responsive to a determination that the GPS receiver is offline, utilizing a holdover stable oscillator to generator the clock signal; the motivation being that a GPS signal is required to synchronize base stations with each other in order to handle handoff between mobile phones. Since GPS systems are "placed high relative to surrounding terrain", they can easily loose contact with base stations so an oscillator must be used to "provide a time reference during this holdover period, as long as the oscillator is stable enough to keep the base stations sufficiently synchronized with other base stations". If the GPS receiver remains in contact with the base stations, the holdover oscillator will not be needed. Refer to Column 1, lines 40-61.

Yahata et al do not disclose that the system utilizes gigabit Ethernet media. Refer to the rejection of claims 1 and 8.

Referring to claim 16, Yahata et al disclose in Figure 6 that the method for synchronizing a base station further comprises utilizing a clock recovery circuit (Figure 6, timing clock generating circuit 53) to generate a synchronizing, master clock signal for the at least one other of the plurality of base stations (slave base stations CS100, CS200...). Refer to the rejection of claims 1 and 8.

Yahata et al do not disclose determining whether the GPS receiver is online. Refer to the rejection of claim 15.

Referring to claim 17, Yahata et al discloses in Figure 6 that the method for synchronizing a base station further comprises processing gigabit Ethernet transmissions with a gigabit transceiver circuit (frame timing detection/control circuit 54). in the at least one other of the plurality of base stations (slave base stations CS100, CS200...). Refer to the rejection of claims 3 and 10.

Referring to claim 18, Yahata et al disclose in Figure 6 that the method for synchronizing a base station further comprises:

Coupling the clock recovery circuit (timing clock generating circuit 53) with a receiver portion of the gigabit transceiver (frame timing detection/control circuit 54) for retrieving a GPS regulated signal. Refer to the rejection of claims 5 and 12.

Utilizing the retrieved GPS regulated clock signal for generating:

A master clock signal for the one other of the plurality of base stations (slave base stations CS100, CS200...).

A reference signal (control signal from the control center and mobile station) for the receiver portion, and a transmitter portion, of the gigabit Ethernet transceiver circuit (frame timing detection/control circuit 54). Refer to claims 7 and 13.

5. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,480,483 to Yahata et al in view of U.S. Patent No. 6,621,810 to Leung in view of U.S. Patent No. 6,194,970 to Nielsen et al, and in further view of U.S. Patent No. 6,728,234 to Hofmann et al.

Yahata et al, Leung and Neilsen do not disclose a voltage compensated crystal oscillator for generating the synchronizing signal for the one other of the plurality of base stations.

Hofmann discloses that a voltage compensated crystal oscillator is used in mobile radio telephones to generate a high-precision, high-frequency signal in order to ensure the reception of the exact information, while compensating against variations in temperature and supply voltage. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a voltage compensated crystal oscillator for generating the synchronizing signal for the one other of the plurality of base stations; the motivation being that voltage compensated crystal oscillator generate a high-precision, high-frequency signal; thereby facilitating precise synchronization between base stations. Refer to Column 1, lines 20-41.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (703) 305-8395. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nguyen Chau can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Ng CW
June 22, 2004

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